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10/816,378	04/01/2004	Chung-Chieh Lee	1014-080US01/JNP-0335	9360
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SHUMAKER & SIEFFERT, P. A.			CHU, WUTCHUNG	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,378	LEE, CHUNG-CHIEH	
	Examiner	Art Unit	
	Wutchung Chu	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 01 April 2004.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-75 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1,2,8-23,25,28-31,37-52,54,55,61-73 and 75 is/are rejected.

7) Claim(s) 3-7,24,26,27,32-36,53,56-60 and 74 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 01 April 2004 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 8/16/2004.

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) Notice of Informal Patent Application

6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 8-10, 23, 25, 28, 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Assa et al. (US2002/0176358).

Regarding claim 1, Assa et al. discloses a traffic control method and system (see **paragraph 9**) comprising:

storing a packet to one of a plurality of hold queues (see **paragraph 9**);
monitoring a loading condition of a transmit queue (see **paragraph 9**);
generating a time epoch based on the loading condition (see **paragraph 12**); and
transferring the packet from the one of the plurality of hold queues to a transmit queue for delivery to a network device via a downstream channel in response to the time epoch (see **paragraph 13**).

Regarding claim 2, Assa et al. teaches monitoring a loading condition comprises monitoring the amount of data residing within the transmit queue (see **paragraph 13**).

Regarding claim 8, Assa et al. teaches further comprising:

- associating the packet with a service flow (**see paragraph 9 agreed bandwidth requirement**);
- identifying a service credit associated with the service flow, wherein the service credit represents a bandwidth allocation available for consumption by the service flow (**see paragraph 13**); and
- assigning the packet to one of the plurality of hold queues based on the identified service credit (**see paragraph 12 and 13**).

Regarding claim 9, Assa et al. teaches assigning the packet comprises assigning an initial packet associated with the service flow to the transmit queue (**see paragraph 12**).

Regarding claim 10, Assa et al. teaches assigning the packet comprises:
identifying a target queue state associated with the service flow, wherein the target queue state specifies a current priority level associated with the service flow (see; and selecting the one of the plurality of hold queues based on the target queue state (**see paragraph 66**).

Regarding claim 23, Assa et al. teaches further comprising reassigning the queue state assigned to each one of the plurality of hold queues in response to the time epoch (**see paragraph 58 and 60**).

Regarding claims 25 and 28, Assa et al. teaches computer program of instruction (**see Assa et al. paragraph 45**) and disclose all the limitations as discussed in the

rejection of claims 1 and 8 and are therefore claims 25 and 28 are rejected using the same rationales.

Regarding claim 30, Assa et al. discloses a traffic control method and system (see paragraph 9) comprising:

a control unit that stores packets from a variable number of service flows to one of a static number of hold queues (see paragraph 9 and 29);
storing a packet to one of a plurality of hold queues (see paragraph 9);
monitoring a loading condition of a transmit queue (see paragraph 9);
generating a time epoch based on the loading condition (see paragraph 12); and
transferring the packet from the one of the plurality of hold queues to a transmit queue for delivery to a network device via a downstream channel in response to the time epoch (see paragraph 13).

Claim Rejections - 35 USC § 103

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 2616

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 11 –19, 21-22, 29, 31, 37-48, and 50-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Assa et al. in view of St. John (US2002/0136200).

Regarding claims 11 –19 and 21-22, Assa et al. disclose all the subject matter of the claimed invention with the exception of assigning the packet comprises:

- comparing the service credit to the size of the packet; and selectively assigning the packet to the one of the plurality of hold queues based on the comparison.
- selectively assigning the packet comprises assigning the packet to the one of the plurality of hold queues when the service credit is greater than or equal to the size of the packet.
- adjusting the service credit by subtracting the size of the packet from the service credit.
- Selectively assigning the packet comprises: comparing the service credit to the size of the packet; and selecting a different one of the plurality of hold queues when the service credit is less than the size of the packet.
- selecting a different one of the plurality of hold queues comprises: adjusting the service credit; and selecting the different one of the hold queues based on the adjusted service credit.

- adjusting the service credit comprises:
 - defining a set of configurable service classes ;
 - pre-computing service quanta for each service class in the set, wherein the service quantum represents a pre-computed bandwidth adjustment for different network loading conditions;
 - associating the packet with one of the service classes;
 - selecting one of the pre-computed service quanta based on the one of the service classes associated with the packet and a current network loading condition; and
 - adjusting the service credit based on the selected one of the pre-computed service quanta.
- Selecting a different one of the plurality of hold queues comprises: adjusting the service credit; and selecting the different one of the hold queues based on the adjusted service credit.
- further comprising: identifying a target queue state associated with the service flow, wherein the target queue state specifies a current priority level associated with the service flow; adjusting the target queue state associated with the service flow to demote the target queue state by one or more priority levels; and selecting the different one of the plurality of hold queues based on the adjusted target queue state.
- adjusting the target queue state comprises: identifying a service class associated with the packet; monitoring a loading condition of a transmit

queue; adjusting the service credit based on the determined service class and the monitored loading condition; and selecting the different one of the plurality of hold queues based on the adjusted service credit and the adjusted target queue state.

- monitoring a loading condition comprises monitoring the amount of data residing within the transmit queue.
- further comprising transmitting the packet from the transmit queue to the network device via the downstream channel.
- transmitting the packet comprises assigning a queue state to each one of the plurality of hold queues, wherein the queue state represents a priority level for the respective hold queue.

St. John from the same or similar fields of endeavor teaches the use of:

- comparison of quantum values and the quantum value of the queues (**see St. John paragraph 54 and 55**);
- packets arriving at the CMTS may be classified based on their individual QoS requirements. The packet may then be directed to a queue capable of providing the requested level of service (**see St. John paragraph 30**);
- the packet is serviced the deficit counter is decreased by the size of the transmitted packet (**see St. John paragraph 51**);
- when the value of the deficit counter is exceeded by the size of the first packet in the queue, operations proceed to set Qos to Qos+1 (**see St John paragraph 52 and figure 4 block 475**).

- The sum of the deficit counter and the update quantum value is then compared to the maximum possible value of the deficit counter for this queue. If this sum is less than the DC.Max.QoS then the deficit counter for this queue is set equal to DC.QoS increased by the Update Quantum Value.QoS. If this sum is greater than the DC.Max.QoS then the deficit counter for this queue is set equal to the DC.Max.QoS (**see St John paragraph 49 and see figure 4 block 440, 460**).
- A set of service classes (**see St John paragraph 32**); quantum value calculation (**see St John paragraph 58**); packets may be directed to a queue capable of providing the requested level of service (**see St John paragraph 30**); selecting and adjusting Qos based on system throughput (**see St John paragraph 55-58**).
- packets may be directed to a queue capable of providing the requested level of service (**see St John paragraph 30**); adjusting queue state by operations proceed to set Qos to QoS+1 (**see St John paragraph 52**).
- packets may be directed to a queue capable of providing the requested level of service (**see St John paragraph 30**); a set of service classes (**see St John paragraph 32**); update and adjust quantum values and monitor system throughput (**see St. John paragraph 49, 56, and 58**); select different queue based on quantum values (**see St. John paragraph 50 and 55**)
- monitoring load condition (**see St. John paragraph 32**).

- Transmitting the packet from queue to downstream channel (**see St. John paragraph 29**).
- packets may be directed to a queue capable of providing the requested level of service (**see St. John paragraph 30**).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the comparison of quantum values and packet directed to queue based on level of service as taught by St. John in the Traffic control method and system of Assa et al. in order to provide flow admission and QoS requirements (**see St. John paragraph 4**).

Regarding claim 29, Assa et al. teaches computer program of instruction (**see Assa et al. paragraph 45**) and disclose all the limitations as discussed in the rejection of claims 21 and is therefore claim 29 is rejected using the same rationales.

Regarding claim 31, 37-48, and 50-52, Assa et al. teaches traffic control system (**see Assa et al. paragraph 29**) and disclose all the limitations as discussed in the rejection of claims 8-19 and 21-23 and are therefore claim 31, 37-48, and 50-52 are rejected using the same rationales.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Assa et al. in view of the background of St. John (US2002/0136200).

Regarding claim 20, Assa et al teaches priority level (see St. John paragraph 52) and disclose all the subject matter of the claimed invention with the exception of all the subject matter of the claimed invention with the exception of dropping the packet when the adjusted target queue state is less than the lowest.

The background of St. John from the same or similar fields of endeavor teaches the use of dropping low priority packets (see St. John paragraph 4). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the dropping low priority packets as taught by the background of St. John in the traffic control method and system of Assa et al. in order to provide efficiency when the system is overscribed.

Regarding claim 49, Assa et al. traffic control system (see Assa et al. paragraph 29) and disclose all the limitations as discussed in the rejection of claims 20 and is therefore claim 49 is rejected using the same rationales.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 54-55, 61-64, 66-73, and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over St. John in view of Sarkinen et al. (US7099275).

Regarding claims 54, 55, St. John discloses methods, systems and computer program products for bandwidth allocation in a multiple access system (**see St. John paragraph 5**) comprising: a cable modem (**see St. John figure 1 box 140 modem**) disclose the subject matter of the claimed invention with the exception of

- a cable modem termination system comprising:
- a downstream scheduler that includes a transmit queue,
- a load monitor that monitors a loading condition of the transmit queue and generates a time epoch based on the loading condition, and
- a queue assignment module that stores a packet to one of a plurality of hold queues, and transfers the packet from the one of the plurality of hold queues to the transmit queue for delivery to the cable modem via a downstream channel in response to the time epoch.
- the load monitor monitors a loading condition by monitoring the amount of data residing within the transmit queue.

Sarkinen et al. from the same or similar fields of endeavor teaches the use of downstream scheduler (**see Sarkinen et al. column 6 line 2**), a scoreboard table (**see Sarkinen et al. column 10 line 45-57**), and a queue (**see Sarkinen et al. column 9 line 2**).

Regarding claim 61, St John teaches the queue assignment module associates the packet with a service flow (**see St. John paragraph 60**), identifies a service credit associated with the service flow, wherein the service credit represents a bandwidth allocation available for consumption by the service flow, and assigns the packet to one

of a plurality of hold queues based on the identified service credit (see **St. John paragraph 58 and 60**).

Regarding claim 62, St John teaches the queue assignment module assigns an initial packet associated with the service flow to the transmit queue (see **St. John paragraph 30**).

Regarding claim 63, St John teaches the queue assignment module further identifies a target queue state associated with the service flow, wherein the target queue state specifies a current priority level associated with the service flow, and selects one of the plurality of hold queues based on the target queue state (see **St. John paragraph 43**).

Regarding claim 64, St John teaches the queue assignment module adjusts the target queue state by identifying a service class associated with the packet (see **St. John paragraph 30**), adjusting the service credit based on the determined service class (see **St. John paragraph 32**) and the loading condition monitored by the load monitor (see **St. John paragraph 49, 56, and 58**), and selecting the different one of the plurality of hold queues based on the adjusted service credit and the adjusted target queue state (see **St. John paragraph 50 and 55**).

Regarding claim 66, St John teaches the queue assignment module further compares the service credit to the size of the packet, and selectively assigns the packet to one of the plurality of hold queues based on the comparison (see **St. John paragraph 54 and 55**).

Regarding claim 67, St John teaches the queue assignment module assigns the packet to one of the plurality of hold queues when the service credit is greater than or equal to the size of the packet (**see St. John paragraph 30**).

Regarding claim 68, St John teaches the queue assignment module adjusts the service credit upon assigning the packet by subtracting the size of the packet from the service credit (**see St. John paragraph 51**).

Regarding claim 69, St John teaches the queue assignment module compares the service credit to the size of the packet and selects a different one of the plurality of hold queues when the service credit is less than the size of the packet (**see St John paragraph 52 and figure 4 block 475**).

Regarding claim 70, St John teaches the queue assignment module adjusts the service credit and selects a different one of the plurality of hold queues based on the adjusted service credit (**see St John paragraph 49 and see figure 4 block 440, 460**).

Regarding claim 71, St John teaches the queue assignment module adjusts the service credit by:

- defining a set of configurable service classes (**see St John paragraph 32**),
- pre-computing service quanta for each service class in the set, wherein the service quantum represents a pre-computed bandwidth adjustment for different network loading conditions (**see St John paragraph 58**),

- associating the packet with one of the service classes (**see St John paragraph 30**),
- selecting one of the pre-computed service quanta based on the one of the service classes associated with the packet and a current network loading condition (**see St John paragraph 55-58**), and
- adjusting the service credit based on the selected one of the pre-computed service quanta (**see St John paragraph 55-58**).

Regarding claim 72, St John teaches the downstream scheduler further includes a queue transition module that assigns a queue state to each one of the plurality of hold queues, wherein the queue state represents a priority level for the respective hold queue (**see St John paragraph 30**).

Regarding claim 73, St John teaches the queue transition module further reassigned the queue state assigned to each one of the plurality of hold queues in response to the time epoch generated by the load monitor (**see paragraph 58 and 60**).

Regarding claim 75, St John teaches the downstream scheduler transmits the packet via a downstream channel to the cable modem (**see St. John paragraph 29**).

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 65 is rejected under 35 U.S.C. 103(a) as being unpatentable over St. John in view of background.

Regarding claim 65, St. John disclose all the subject matter of the claimed invention with the exception of the queue assignment module further compares the adjusted target queue state to a lowest priority level, and drops the packet when the adjusted target queue state is less than the lowest priority level.

The background of St. John from the same or similar fields of endeavor teaches the use of dropping low priority packets (**see St. John paragraph 4**). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the dropping low priority packets as taught by the background of St. John in the traffic control method and system of Assa et al. in order to provide efficiency when the system is overscribed.

Allowable Subject Matter

12. Claim 3-7, 24, 26-27, 32-36, 53, 56-60, and 74 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sala et al. (SU2001/053152)

Kalkunte et al. (US2003/0128707)

Lam et al. (US6198724)

Van Der Zee et al. (US7177274)

Lyles et al. (US6563829)

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wutchung Chu whose telephone number is 571 270 1411. The examiner can normally be reached on Monday - Friday 1000 - 1500EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan D. Orgad can be reached on 571 272 7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AWC/
Wutchung Chu

EDAN D. ORGAD
SUPERVISORY PATENT EXAMINER

Edan Orgad 8/26/07